

ANALYSIS OF THE COST OF LATE CONTRACTOR DELIVERY

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DEFENSE LOGISTICS AGENCY

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DLA-LO

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FOREWORD

The Defense Logistics Agency (DLA) Directorate of Contracting requested DLA's Operations Research and Economic Analysis Office, DLA-LO, to quantify the costs incurred by DLA as a result of late vendor delivery. This report documents and summarizes the efforts and conclusions reached in this analysis.

The costs of late delivery for items managed at the Defense General Supply Center (DGSC) were found to be approximately \$11 for the effort and materials expended in the attempt to expedite delivery of the contracted assets and \$314 for the increased safety levels which must be purchased and maintained as a result of the late delivery. These costs represent about six percent of the contract value for a typical DGSC late delivery. Two approaches were suggested which have the potential to reduce or recover the costs incurred by DLA because of late vendor delivery.

The primary recommendation is to test the application of this cost of a late delivery in a sample of a center's contracts as soon as possible.

ROGER C. ROY

Assistant Director Policy and Plans

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EXECUTIVE SUMMARY

The Packard Commission has recommended that the government manage its purchasing operations more like the private sector by emphasizing quality and schedule in addition to price. The Defense Logistics Agency's (DLA) Directorate of Contracting is examining the possibility of quantifying the costs associated with poor contractor performance and incorporating these costs into the bid evaluation process. The DLA Operations Research and Economic Analysis Office (DLA-LO) has been tasked with evaluating the cost of late vendor delivery.

This study examines the costs of late vendor delivery for items managed at the Defense General Supply Center (DGSC). Both the direct costs of late delivery which include the labor and material expended in the attempt to resolve the situation, and the indirect costs which include the maintenance of increased safety levels of material because of increased lead times, are addressed by this analysis.

The cost of a typical late delivery to DGSC has been quantified by this analysis to be approximately \$11 in labor and materials used to expedite delivery of the materiel, and \$314 in increased safety levels and maintenance of this materiel. These costs of late delivery represent approximately six percent of the typical replenishment contract cost.

Two approaches for the application of the costs of late delivery to the contracting function have been proposed in this study to reduce the overall cost to DLA in the purchase of materiel. The first approach is to use the costs of late delivery in conjunction with contractors' performance histories in the bid evaluation process to assign premiums/penalties which can be used to offset each contractor's bid. The second approach is to assess liquidated damages against contractors who deliver late using the costs of late delivery developed in this effort.

We recommend that one or both of the proposed contracting approaches be tested at DGSC to evaluate the feasibility of using late delivery costs to reduce the overall cost to DLA for material purchases.

I. <u>INTRODUCTION</u>

- A. <u>Background</u>. One recommendation from the Packard Commission's study on Defense management was that the government should buy more like the private sector, emphasizing quality and timeliness as well as price. The Defense Logistics Agency's (DLA) Directorate of Contracting is examining ways to implement this recommendation by including consideration of contractor performance in the bid evaluation process. Generally, DLA only considers price in the vendor selection process, but quantification of the costs associated with poor contractor performance could allow consideration of these costs in the bid evaluation process as well.
- B. <u>Objective</u>. The objective of this study is to quantify the cost per incident of late contractor delivery.

C. Scope

- 1. Definition of Poor Performance. The costs of poor performance may be viewed as falling into two categories, costs associated with late contractor delivery and costs associated with poor quality. This effort examines the cost of poor contractor performance as exhibited in delivery timeliness. Furthermore, this effort is limited to the quantification of DLA incurred costs. Costs external to DLA (user costs) may be more substantial, but are far more difficult to obtain and verify. (See Figure 1 for a breakdown of some of the costs of poor performance, where the areas in bold print represent those costs addressed by this analysis.) The quantification of the DLA costs will at least provide a firm lower bound to the costs of poor contractor performance.
- 2. <u>Direct Versus Indirect Costs</u>. An attempt has been made to distinguish between direct and indirect costs incurred by DIA as a result of late delivery. The direct costs represent the labor and material expended in resolving late deliveries. One of the most evident indirect costs to DIA is the cost of maintaining increased safety levels of materiel required because of increased production lead times (PLT). This analysis quantifies those costs associated both with the direct actions taken to obtain the contracted materiel and the indirect costs resulting from the increased safety levels which result from late deliveries.
- 3. <u>Test Using One Supply Center</u>. The cost of late contractor delivery for items managed by the Defense General Supply Center (DGSC) was quantified to test the methodology and the feasibility of implementing the results. Costs at the other Supply Centers are probably different because of item population and policy differences.

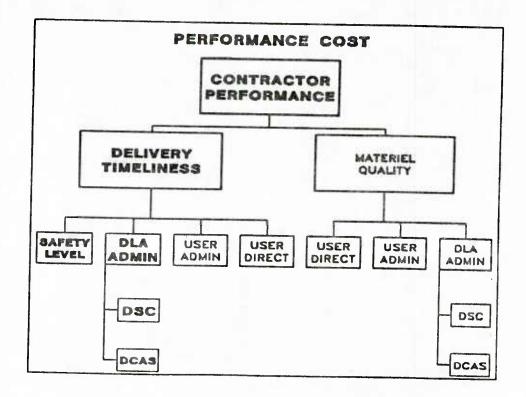


Figure 1. PERFORMANCE COST HIERARCHY

- II. APPROACH. This analysis was divided into two parts. The first part of the analysis involved quantification of the indirect costs associated with late contractor delivery. These costs were identified in the increased safety levels resulting from increased lead times. The second part of the analysis examined the direct costs of late delivery. These direct costs are primarily the expenditure of labor and materials required to bring about delivery of the items.
- A. <u>Indirect Cost Methodology</u>. The approach used to develop the indirect costs was to (1) combine items to obtain a representative typical item for each FSC, (2) run a supply performance model to compute safety levels resulting from changing the PLT, and (3) compute a daily lateness cost for each FSC.
- B. <u>Direct Cost Methodology</u>. The approach used to develop the direct costs of late delivery was to (1) identify the functions performed by DLA as a result of late contractor delivery, (2) construct a hierarchical description (decision tree) of the possible processing paths in the resolution of an incident of late delivery, (3) develop cost estimates (labor requirements and material costs) for each subtask of the decision tree, (4) develop probabilities for each branch in the decision tree, and (5) compute the expected cost of late delivery from the subtask cost and branch likelihood information.

III. ANALYSIS

A. Analysis of Indirect Costs

1. <u>Item Aggregation</u>

For the purposes of simplification of the analysis, items from the Materiel Readiness Decision Support System (MARS) data files were combined within each FSC to produce a representative "average" item for that FSC. Items were excluded from this aggregation process based on the following criteria:

- o Nonstocked status,
- o Zero demand.
- Zero unit price,
- o Numeric Stockage Objective (NSO) status.

For those items passing this screening step, averages were computed over each FSC for the following item parameters:

- o Unit Price
- o Stock on Hand Quantity
- o Backorder Quantity
- o Due in Quantity
- o Administrative Lead Time (ALT)
- o Production Lead Time (PLT)
- o Procurement Cycle Period
- o Smoothing Constant (ALPHA)
- Average Requisition Size
- Mean Absolute Deviation
- Prepositioned Mobilization Reserve Materiel Requirement (PMRMR)
- o Quarterly Forecast of Demand (QFD)
- Quarterly Forecast of New Demand

- o Annual Demand Quantity
- o Annual Demand Frequency
- 2. <u>Safety Level Computation</u>. A modified version of the Projected Performance Model (PERMES) from the MARS system was used to compute safety levels using the parameters for the FSC representative items developed in the previous step. The PERMES model computes standard supply performance measures under varying sets of conditions. (For further details on the PERMES model see DLA Operations Research and Economic Analysis Office Report, "Materiel Readiness Decision Support System (MARS)," October 1984.) For this study, the default economic order quantity and safety level algorithms from the Standard Automated Materiel Management System (SAMMS) were used. A set of five runs was made to compute safety levels for cases where delivery ranged from thirty days early to ninety days late.
- 3. Assumptions for Cost Computations. Assumptions made for the analysis are:
- a. The Contract Delivery Date (CDD) is equal to the Award Date plus the Production Lead Time (PLT); therefore, a late delivery necessarily causes an increase in the PLT.
- b. The PLT continues to grow and never returns to its original level. (DLA Operations Research and Economic Analysis Office Report, "The Impact of Contracting Initiatives on Lead Time," November 1986 discusses this phenomena.) The current mechanism of setting the CDD based upon PLT may lead to PLT creep.
- c. The remaining life of the item is assumed to be five years. (DOD Parts Control Program Report PCP-86-01, "Cost-Benefit Reporting Technique for Military Parts Control Advisory Groups," dated 7 November 1986 by the Defense Electronics Supply Center, assumes new parts to have an inventory life of ten years. We assume that the typical item has experienced half of its inventory life.)
- d. The daily lateness cost was developed using the ninety day late case. The daily cost is relatively insensitive to the amount of time the contract is late from zero to ninety days, and the ninety day late case was chosen to minimize the small amount of variation from the nearly linear relationship between cost and lateness.
- e. The average contract cost was calculated using data representing stock replenishment buys for the period October 1982 May 1985. Direct deliveries were excluded from consideration in the computation of average contract value because they were assumed not to be representative buys.
- 4. <u>Safety Level Cost Computation</u>. The results from the PERMES runs were used to compute the change in the safety level cost resulting from the varying delivery circumstances. Late deliveries can lead to increased safety levels because a late delivery affects an item's

production lead time (PLT). (The PLT of record is computed by adding one-third of the previous PLT of record to two-thirds of the PLT of the current buy.) The PLT is one of several item parameters used to compute safety levels, and an increase in PLT leads to an increase in the safety level quantity. The cost of holding the increased safety has been added to the investment cost of obtaining the increased safety level to compute the cost of the late delivery. The SAMMS holding cost rate of 18 percent per year was used for computations. The holding cost has been discounted over the remaining life of the material in accordance with DLAM 7041.1, "Economic Analysis". The ratio of safety level cost to average contract cost was then computed for each supply class.

5. <u>Indirect Cost Findings</u>

The results of the safety level cost computations are presented in Table 1: In Table 1, the first column, labeled "FSC", represents the Federal Supply Class (FSC); the second column, labeled "SL INVST COST(\$)", represents the investment cost (per day of lateness) of the increased safety level; the third column, labeled "HOLDING COST (\$)", represents the discounted life cycle cost (per day) of holding the increased safety level; the fourth column, labeled "TTL DAY COST (\$)", represents the sum of the previous two columns; the fifth column, labeled "AVERAGE CONTRACT", represents the average contract value for stock replenishment buys for that FSC; the sixth column, labeled "DAY COST RATIO (%)", is the percentage of the contract cost represented by the daily total safety level cost; the seventh column, labeled "DGSC RATIO (%)", represents the percentage of the contract value that the safety level cost represents for a typical DGSC late delivery (see the next paragraph for details on "typical" lateness at DGSC); and the last unlabeled column represents the number of contracts used for the computation of average contract value. At the end of the table is a summary for all FSC's weighted by contract frequency.

The daily lateness costs for each FSC due to increased safety levels were observed to range from zero to over five percent of contract cost per day. However, for those FSC's where the number of observations (contracts) is high (above 100), the range is from zero to one percent of the contract The average FSC daily lateness cost is 0.125 percent of cost per day. contract cost. Using available delivery statistics, the cost of a typical late delivery can be derived. A study by the DLA Operations Research and Analysis Office ("Impact of Competition on Economic Delinquencies," May 1987) found that 31 percent of DGSC purchases were delivered late (that is, after the contract delivery date (CDD)). study also found that these late deliveries were 49 days late on the average. Using these figures together with the computed daily safety level lateness cost yields \$314 as the cost of an average DGSC late contract in increased safety levels. This cost for the average DGSC late delivery is 6.1 percent of the average replenishment contract cost. On an FSC basis, the safety level cost for typical DGSC late deliveries ranged from zero to over two hundred percent of contract cost (zero to fifty percent for FSC's with many contracts). Table 2 shows the distribution of computed FSC safety level lateness costs as a percentage of contract cost for a typical DGSC late delivery.

Table 1
SAFETY LEVEL COSTS

	•						
500		HOLDING	TTL DAY	AVERAGE"	DAY COST	DGSC RATIO(%)	
FSC	SL INVST	COST (s)	COST (8)	CONTRACT	RATIO(%)	RATIONA	
	C031 (3)					3.043857	3
1040	0.23	0.16	0.38	899.94	0.041692	34.383506	42
1055	7.33	5.25	12.58	2536:58	0.499902	0.000000	0
1075	1.15	0.85	2:04	0.00	0.000000	0.000000	0
1080	4.18	3.99	7.17	0.00	0.000000	0.00000	. 0
1090	4.70	3.37	8.07	0.00	0.000000	0.000000	0
2050	0.00	0.00	0.00	0.00	0.000000	0.000000	0
2090	0.00	0.00	0.00	0.00	0.000000	0.000000	0
2510	35.50	25:41	60.91	0.00		0.00000	0
3210	0.00	0.00	0.00	0.00	0.000000	10.680127	33
3220	4.29	3.07	7.36	3378.55	0.21/902		
				797, 12	0.780713	38.354644	176
2230	3.63	2.60	6.22	1619.21	0.572369	28.047058	
3405	5.40	3.87	5.37	0.00	0.00000	0.000000	0
3410	3.06	3.18	5.35	0.00	0.000000	0.000000	0
3413	0.00	0.00	0.00	8639, 18	0.298262	15.514816	63
3415	13.09	9.37	32.46		0.000000	0.000000	10
3416	0.00	0.00	0.00	1778.10	0.213612	15.376785	13
3417	3.90	3.06	4.97	1585.23	0. 101835	4.875210	21
3419	3.55	2.54	6.09	5997.98	2.125805	104.260413	3
3424	1.63	1.31	3. 14	147.85	0.000000	0.000000	22
3426	0.00	0.00	0.00	5920.83			
			0.00	1790:01	0.000000	0.000000	332
3431	0.00	0.00		2309.57	0.000000	0.000000	
3432	0.00	0.00	0.00	1648.41	0.515712	28.269867	321
3433	4.95	3.55	8.50	5 15 100	0.594021	25. 107025	1
3436	3.16	2.28	8.45	14599.53	0.017352	0.950268	7
2428	1.48	1.06	2.53	3089, 45	0.000000	0.000000	1955
3439	0.00	0.00	0.00	5026.95	0. 163625	E.017645	87
3441	4.79	3.42	6.32		0.000000	0.000000	1
2442	0.00	0.00	0.00	115.88	0.020216	0.990683	1
3443	0.34	0.17	0.42	2072.00	0.257994	12.641694	22
3444	10.07	7.21	17.27	6694.52			16
		0.00	0.00	2889.62	0.000000	0.000000	10
3448	0.00	0.00	0.00	1656.90	0.000000	0.000000	1
3446	0.00	0.59	1.42	255.00	0.855871	27.237656	A A
3448	0.63	0.00	0.00	19345.25	0.000000	0.000000	11
3449	0.00	4.96	11.94	7381.10	0.163925	6.032307	1954
3450	6.96		11.38	1710.89	0.658225	32.302002	104
3455	6.57	4.71	2.75	649.293	0.327864	16.055336	729
3456	1.62	1.16	0.00	1640.21	0.000000	0.000000	69 .
3450	0.00	0.00	4.55	1295.46	0.351383	17.317683	291
3485	2.65	1.90	10.48	1532.34	0.682489	33.441936	
25 10	6.09	4,36	10.70			1.668406	2
	1.58	1, 13	2.71	7105.00	0.038131	6, 131510	151
3520		3.01	4.61	3842.37	0. 125133	15.539400	265
3530	3.80 . 5.99	4.38	10.27	3238.85	0.317131	40,684174	22
36 10		4.80	11.51	1388: 14	0.630289	0.000000	36
3611	6.71	0.00	0.00	6502.40	0.000000	0.000000	0
36 15	0.00	0.07	0. 17	0.00	0.000000	0.000000	Ö
762 8	0.10	7.54	18 . 07	0.00	0.000000	0.000000	ŏ
630		1.37	3.28	0.00	0.000000	0.000000	ŏ
3638	1.51	0.40	0.98	0.00	0.000000	10.084764	436
3650	0.86 7.10	5.06	12.18	5916.06	0.205812	10.007.07	

6

Table 1 (Continued)

FSC SI INVST (S)								
1873 1873 1875						DAY COST		
250 2.35 2.33 5.58 1383.06 0.403188 0.000000 0.2000000 0.2000000 0.2000000 0.200000 0.200000 0.200000 0.200000 0.200000 0.200000 0.200000 0.200000 0.200000 0.200000 0.200000 0.200000 0.20000000 0.20000000 0.20000000 0.20000000 0.20000000 0.20000000000	FSC		HOLDING				RATIO(%)	
3460 3.25		COST (\$)	COST (\$)	COST (8)	CONTRACT	RATIONA		
3870						0.403169	19.755264	- ,
\$280			2.33	5.58				_
1.00		6.35	4.55	10.90			0.000000	_
1.00		0.00	0.00	0.00			0.00000	_
1.80		0.00	0.00	0.00			1.677128	-
2550 0.00		2.78	1.98	4.74			0.000000	
### 2950		0.00	0.00	0.00	12158.00		0.000000	
##10 0.00 0.00 0.00 0.00 2##13.05 0.00000 0.00000 62 ##130 0.00 0.00 0.00 0.00 9#75.80 0.00000 0.000000 62 ##130 0.00 0.00 0.00 0.00 0.00 0.00000 0.000000	3990	0.00	0.00	0.00	599 3 0.10			
4120 0.00 0.00 0.00 0.00 9475.80 0.000000 28.33448 3273 4140 7.34 8.40 12.83 8584.70 0.200000 0.000000 714 4140 0.00 0.00 0.00 0.00 8485.50 0.000000 0.000000 714 4140 0.00 0.00 0.00 0.00 8485.50 0.000000 0.000000 714 4140 0.00 0.00 0.00 0.00 8485.50 0.000000 0.000000 714 4140 0.00 0.00 0.00 0.00 8485.50 0.000000 0.000000 714 4140 0.00 0.00 0.00 0.00 8485.50 0.000000 0.0000000 714 4150 0.00 0.00 0.00 0.00 8485.50 0.000000 0.000000 714 4150 0.00 0.00 0.00 0.00 1520.83 0.000000 0.000000 3708 4150 0.00 0.00 0.00 0.00 1520.83 0.000000 0.000000 3708 4150 0.00 0.00 0.00 0.00 1520.83 0.000000 0.000000 0.000000 1520 4150 0.00 0.00 0.00 0.00 1520.83 0.000000 0.000000 0.000000 1520 4150 0.00 0.00 0.00 0.00 1520.83 0.000000 0.000000 0.000000 1520 4150 0.00 0.00 0.00 0.00 1520.83 0.000000 0.000000 0.000000 1520 4150 0.00 0.00 0.00 0.00 1520.83 0.000000 0.000000 0.000000 0.000000 0.000000	4110				24813.05			
### ### ### ### ### ### ### ### ### ##	4120				9475.80			3233
4140 7.54 8.40 12.83 8854.70 0.220914 0.002000 35 4220 0.00 0.00 0.00 8.98.50 0.002000 0.002000 735 4240 0.00 0.00 0.00 8.68.50 0.002000 0.002000 711 4240 8.94 4.25 10.20 8977.39 0.274784 18.362915 84 4823 8.88 7.06 16.82 4513.50 0.274784 18.362915 84 4823 9.88 7.06 16.82 4513.50 0.20345 14.861919 84 4824 0.00 0.00 0.00 0.00 1.00 1.002000 0.002000 0.002000 14.861919 84 4823 9.01 3.88 6.89 22192 0.002000 0.002000 0.002000 14.861919 84 8826 0.00 0.00 0.00 0.00 2150.42 0.002000 0.002000 14.861919 84 8827 0.00 8.60 0.00 1.00 2150.40 0.002000 0.002000 14.861919 827 8827 4.78 3.41 8.17 2672.04 0.00200 0.002000 0.002000 14.86185 827 8827 4.78 3.41 8.17 2672.04 0.00200 0.002000 0.002000 14.86185 827 8828 0.00 0.00 0.00 4522.99 0.00200 0.002000 0.002000 14.86185 828 8830 0.00 0.00 0.00 4522.99 0.00200 0.0020000 0.002000 0.002000 0.002000 0.002000 0.002000 0.002000 0.0020000 0.002000 0.002000 0.002000 0.002000 0.002000 0.002000 0.0020000 0.002000 0.002000 0.002000 0.002000 0.002000 0.002000 0.0020000 0.002000 0.002000 0.002000 0.002000 0.002000 0.002000 0.0020000 0.002000 0.002000 0.002000 0.002000 0.002000 0.002000 0.0020000 0.002000 0.002000 0.002000 0.002000 0.002000 0.002000 0.0020000 0.002000 0.	4130				3021.41	0.537850		
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\$150 0.00 0.00 0.00 \$191.43 \$23.209900 \$874 \$210 \$15 \$15 \$3.68 \$6.83 \$1964.07 0.473672 \$23.209900 \$874 \$220 \$5.80 \$4.65 \$11.18 \$3091.45 0.360524 \$17.663649 \$2310 \$230 0.60 0.60 0.60 0.60 9383.30 0.600000 0.600000 \$1890 \$240 0.60 0.60 0.60 0.60 0.60 9383.30 0.600000 0.600000 \$1890 \$240 0.60 0.60 0.60 0.60 0.60 2130.63 0.600000 0.600000 \$1890 \$250 0.60 0.60 0.60 0.60 0.60 2130.63 0.600000 0.600000 \$1890 \$250 0.60 0.60 0.60 0.60 0.60 2130.63 0.600000 0.600000 \$190 \$250 \$250 0.60 0.60 0.60 0.60 0.60 24967.67 0.600000 0.600000 \$42 \$2320 0.60 0.60 0.60 0.60 4094.47 0.600000 0.600000 \$292 \$2320 0.60 0.60 0.60 0.60 \$475.70 0.600000 0.600000 \$292 \$2300 0.60 0.60 0.60 \$4875.70 0.600000 0.600000 \$292 \$250 \$250 0.60 0.60 0.60 \$4875.70 0.600000 0.600000 \$292 \$250 \$250 0.60 0.60 0.60 \$4875.70 0.600000 0.600000 \$292 \$250 \$250 0.60 0.60 0.60 \$4875.70 0.600000 0.600000 \$292 \$250 \$250 0.60 0.60 0.60 0.60 \$4875.70 0.600000 0.600000 \$292 \$250 \$250 0.60 0.60 0.60 0.60 \$4875.70 0.600000 0.600000 \$292 \$250 \$250 0.60 0.60 0.60 0.60 \$4875.70 0.600000 0.600000 \$292 \$250 \$250 0.60 0.60 0.60 0.60 0.60 \$4875.70 0.600000 0.600000 \$292 \$250 \$250 0.60 0.60 0.60 0.60 0.60 \$250 \$250 \$250 \$250 \$250 \$250 \$250 \$25		0.00	0.00	0.00			0.000000	
\$210 \$.15 \$.3.58 \$.8.23 \$.964.07 \$.0.473672 \$.23.2090 \$.2200 \$.5.50 \$.4.65 \$.11.15 \$.3091.45 \$.0.360524 \$.17.665649 \$.2910 \$.2200 \$.5.50 \$.4.65 \$.11.15 \$.3091.45 \$.0.600000 \$.0.000000 \$.752 \$.2200 \$.0.00 \$.0.00 \$.0.00 \$.0.00 \$.0.00 \$.0.000000 \$.0.000000 \$.0.000000 \$.2200 \$.2200 \$.0.000000 \$.0.000000 \$.0.000000 \$.2200 \$.2200 \$.0.000000 \$.0.000000 \$.0.000000 \$.0.000000 \$.2200 \$.2200 \$.2200 \$.0.000000 \$.0.000000 \$.2200 \$	6 150	0.00	0.00	0.00	3419.43	0.00000		
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6260 0.00 0.00 0.00 0.00 4094.47 0.000000 0.000000 292 6340 0.00 0.00 0.00 6119.65 0.000000 0.000000 994 6350 0.00 0.00 0.00 0.00 4875.70 0.000000 0.000000 994 6605 8.05 3.51 8.66 \$782.24 0.146768 7.336529 227 6610 4.38 3.14 7.52 6456.90 0.146768 8.703515 417 6610 4.38 3.14 7.52 6456.90 0.116398 8.703515 417 6619 0.00 0.00 0.00 7359.86 0.000000 0.000000 317 6620 6.83 4.66 11.71 9030.14 0.129712 6.355910 931 6625 0.00 0.00 0.00 5309.43 0.000000 0.000000 4645 645 8.43 3.69 9.33 3649.68 0.255507 12.519628 741 6645 8.43 3.69 9.33 3649.68 0.255507 12.519628 741 6650 6.19 4.42 10.63 3291.09 0.322664 25.249527 39 6655 17.76 12.73 30.91 \$621.20 0.515297 25.249527 39 6655 9.46 8.79 16.26 10256.71 0.18786 7.780633 113 6665 9.46 8.79 16.26 10256.71 0.18786 7.780633 113		0.00	0.00	0.00	2130.63			
6320 0.00 0.00 0.00 4094.47 0.000000 0.000000 292 6340 0.00 0.00 0.00 0.00 6119.65 0.000000 0.000000 994 6350 0.00 0.00 0.00 0.00 4875.70 0.000000 0.000000 994 6805 8.05 3.51 8.66 \$782.24 0.146766 7.336529 237 6610 4.38 3.14 7.52 6456.90 0.116398 8.703515 417 6619 0.00 0.00 0.00 7359.86 0.000000 0.000000 317 6620 6.89 4.66 11.71 9030.14 0.129712 6.355910 931 6620 6.89 4.66 11.71 9030.14 0.129712 6.355910 931 6625 0.00 0.00 0.00 5309.43 0.000000 0.000000 464 6635 0.00 0.00 0.00 5309.43 0.000000 0.000000 464 6635 0.00 0.00 0.00 0.00 5309.43 0.255507 12.519628 741 6645 5.43 3.69 9.33 3649.68 0.255507 12.519628 741 6645 650 6.19 4.43 10.63 3291.09 0.322664 15.620327 65 6650 6.19 4.43 10.63 3291.09 0.322664 15.620327 35 6650 0.00 0.00 0.00 0.00 5004.37 0.000000 0.000000 352 6655 9.46 8.79 16.26 10256.71 0.158766 7.760533 113 6665 9.46 8.79 16.26 10256.71 0.158766 7.760533 113 6665 9.46 8.79	6260	0.00		0.00	24967.67			42
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6605 8.05 3.81 8.66 \$782.24 0.146765 7.32 6.703515 417 6610 4.38 3.14 7.52 6456.90 0.116398 8.703515 417 6619 0.00 0.00 0.00 7359.86 0.000000 0.000000 317 6620 6.83 4.66 11.71 9030.14 0.129712 6.353910 931 6635 0.00 0.00 0.00 8308.43 0.000000 0.000000 464 6643 5.43 3.69 9.33 3649.68 0.258507 12.819628 74 6645 6.19 4.43 10.63 3291.09 0.322664 15.620327 68 6655 17.78 12.73 30.91 8621.20 0.515297 25.249527 39 6655 9.46 8.79 16.26 10256.71 0.188786 7.780633 113 6665 9.46 8.79 16.26 10256.71 0.188786 7.000000	6350				4873.70			237
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6635 0.60 0.00 0.00 8309.43 0.000000 12.819628 741 6645 5.43 3.69 9.33 3649.68 0.258507 12.819628 741 6650 6.19 4.43 10.63 3291.09 0.322664 15.620327 65 6655 17.78 12.73 30.91 8621.20 0.515297 25.24527 39 6660 0.00 0.00 5004.37 0.000000 0.000000 352 6655 9.46 8.79 16.26 10256.71 0.186765 0.000000 0.000000					9030, 14			
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	 /0	0.00	0.00	0.00	7030.73			

7

		HOLDING	TTL DAY	AVERAGE	DAY COST	DGSC	
FSC	SL INVST	COST (8)	COST (8)	CONTRACT	RATIO(%)	RATIO(%)	
	C031 (#)				0.450157	22.057709	60
6675	8.22	5.96	14.26	3172.21	0.245749	12.041666	202
6680	6.17	4.42	10.58	4306.22	0. 231884	16.262299	625
6685	7.19	5.14	12.33	3714.72	0. 145562	7.132549	341
	2.69	2.79	6.68	4588.81	0.054919	2.691009	7:
6695	4.14	2.97	7.11	12942.81		3.714679	220
6710	5.12	3.67	8.79	11591.46	0.075810	5.059555	231
6720	5.51	2.95	9.46	9161.00	0.103256	22.170135	494
6730	6.07	4.35	10.42	2202.56	0.472660	0.000000	18 18
6740		0.00	0.00	9421.29	0.000000	0.000000	522
6750	0.00	0.00	0.00	7701.20	0.000000	0.00000	
6760	0.00	0.00				4.105187	
	2.82	2.02	4.83	5766.94	0.083779	5.515141	26
6770	6.25	3.23	9. 18	6156.38		0.00000	810
6780	0.00	0.00	0.00	12656.41	0.000000	226.646682	6
6810	60.63	43.40	104.03	2249.10	4.625443	0.000000	160
6820	0.00	0.00	0.00	11526.89	0.000000	0.000000	135
6630		0.00	0.00	26237.29	0.000000	0.000000	1241
6840	0.00	0.00	0.00	20618.82	0.000000	2.828473	7
6850	0.00	2.22	8.33	9226.70	0.057724		249
6910	3.10	0.00	D.00	13325.48	0.000000	0.000000	211
6920	0.00		13, 13	2669.81	0.481802	24.098312	
8930	7.05	5.48				0.00000	25
	0.00	0.00	0.00	4498.03	0.000000	0.000000	1422
8940	0.00	0.00	0.00	6524.27		0.000000	752
7210	0.00	0.00	.0.00	11562.50	0.000000	21.790482	99
7320		8.92	21.39	4810.88	0.444704	0.000000	1
7360	12.47	0.00	0.00	85.60	0.000000	34, 241302	43
7450	0.00	2.81	6.26	296.04	0.692302		6
7610	3.05	3.36	6. 10	401.85	2.014696	98.720106	701
7640	4.72		6.96	717.74	0.972114	47.633576	127
7690	4.07	2.81	0.00	21881.50	0.000000	0.000000	125
6110	0.00	0.00	0.00	26547.37	0.000000	0.000000	129
5 12O	0.00	0.00	0.00				66
	6.25	4.47	10.72	1021.75	1.048914	61.396774	
125		0.00	0.00	11222.91	0.000000	14.992346	18
1130	0.00	8.11	12.26	4006.36	0.305966		2
140	7.14		0.00	483.25	0.000000	0.000000	1031
145	0.00	0.00	0.00	29047.63	0.000000	0.000000	51
150	0.00	0.00	0.00	10710.80	0.000000	0.000000	\$13
160	0.00	0.00	10.36	1562.22	0.663050	32.489441	789
220	8.04	4.32	0.00	8740.25	0.000000	0.000000	268
330	0.00	0.00	7.07	2691.12	0.252714	12.072078	\$7
340	4.12	2.95	0.00	10739.71	0.000000	0.000000	57
250	0.00	0.00	U.W				730
	- 46	S. 12	12.26	2001.33	0.612641	30.029190 27.828171	62
390	7.18	8.29	22.26	3918.99	0.867922		12
925	12.87		0.00	11034.82	0.00000	0.000000	
1930	0.00	0.00	•. ••				

DESIGNATE METENTED BY CONTRACT FREO

TTL DAY	CONTRACT	RATIO (X)	RATID (%)
2.44	8105.93	0.12541	6.14522

Table 2

<u>DISTRIBUTION OF SAFETY LEVEL LATENESS COSTS</u>

DGSC SL	Number of	Percent of
Cost Ratio (%)	FSC's	
		<u>Total</u>
0	79	55.6
0 - 5	10	7.0
5 - 10	<u>-</u>	
	14	9.9
10 - 15	10	7.0
15 - 20	9	6.3
20 - 25	•	
	5	3.5
25 - 30	6	4.2
30 - 35	3	
35 - 40		2.1
	1	0.7
40 - 45	1	0.7
45 - 50	1	
	1	0.7
over 50	3	2.1

B. Analysis of Direct Costs

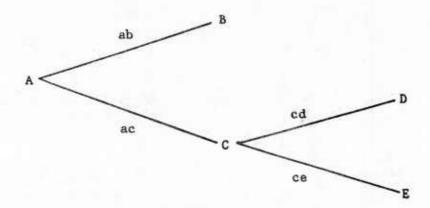
- 1. <u>Identification of Supply Center Required Functions</u>. Defense Supply Center (DSC) actions required as a result of late contractor delivery include:
- a. F-38 Report Production The F-38 report is generated each month to identify contractors with contract lines at least thirty days late.
- b. F-38 Report Processing The process of reviewing the F-38 report, mailing it to the contractor, and processing it following the contractor's response is directly attributable to late delivery.
- c. Delivery Assurance Status requests must be satisfied occasionally for delinquent items.
- d. Delinquent Contract Reconciliation with DCAS This function is required to ensure that a contract is indeed delinquent through the validation of Supply Center records with DCAS records.
- e. Delayed Delivery Report Processing The delay in delivery reports generated by DCAS must be responded to.
- f. Management of Backorders Some late deliveries result in backorders which may require intensive management.
- g. Reprocurement of Cancelled Contracts Some delinquencies will lead to cancellation and therefore reprocurement of the assets. If the reprocurement cost is not received as consideration from the contractor, then it is attributable to the late delivery.

- 2. <u>Identification of DCAS Required Functions</u>. The Defense Contract Administration Services (DCAS) actions required as a result of late delivery are limited to:
- a. Reporting Delayed Deliveries Any contract which is expected to be late by a specified length of time (usually thirty days) must be reported.
- b. Increased Surveillance Late delivery may result in increased monitoring of the contract.

3. Late Delivery Cost Computation Methodology.

The expected cost of late contractor delivery is computed by first computing the expected cost of each branch of the decision tree and then summing these costs. For example, consider the decision tree in Figure 2.

Figure 2. SAMPLE DECISION TREE

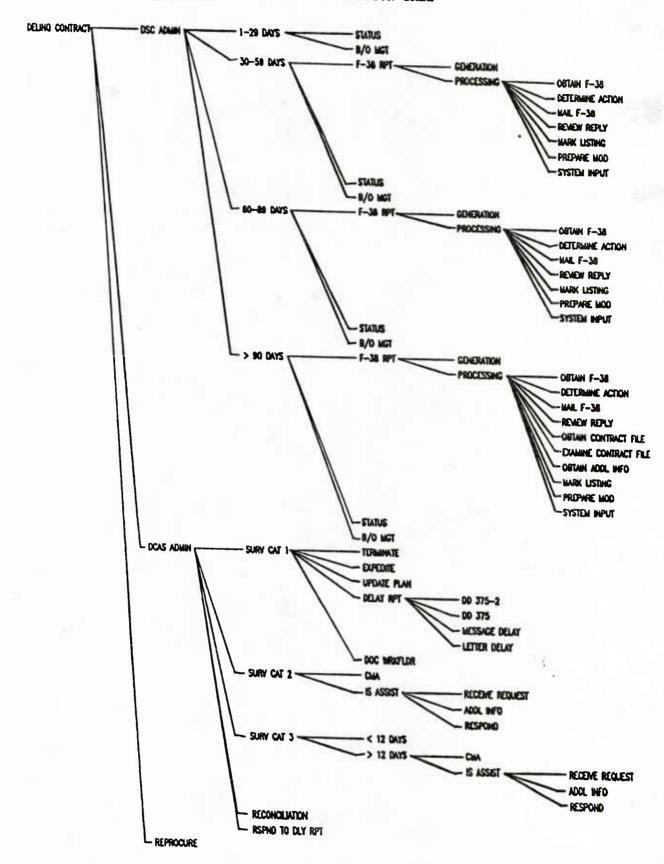


There are five nodes denoted \underline{A} , \underline{B} , \underline{C} , \underline{D} and \underline{E} . Nodes \underline{B} and \underline{C} represent subtasks under node \underline{A} , while nodes \underline{D} and \underline{E} represent subtasks under node \underline{C} . There are four path probabilities denoted \underline{ab} , \underline{ac} , \underline{cd} and \underline{ce} . The path probability \underline{ab} represents the probability of subtask \underline{B} occurring under node \underline{A} . With each subtask at the lowest level there is a cost associated with performing the subtask. Therefore the expected cost at node \underline{A} in this instance can be computed using the formula:

The costs for late delivery are computed in the same manner using the decision tree representing the tasks performed as a result of late vendor delivery.

4. <u>Decision Tree</u>. The decision tree constructed for late delivery cost evaluation is shown in Figure 3. This decision tree describes the tasks performed as a result of late delivery. At the Supply

Figure 3. DIRECT COST DECISION TREE



Center, little effort is expended working a late contract until it becomes thirty days late. This provides contractors with a thirty day grace period. DCAS corrective action generally begins when the contract is twelve days late (for Surveillance Category 3 items). It should be noted that responsibility for administration of large purchases is predominantly given to DCAS (Supply Centers manage few, if any, large purchase contracts), while small purchases are almost exclusively administered by the purchasing Supply Center.

- 5. <u>Subtask Cost Estimates</u>. The cost estimates for the decision tree nodes are shown in Table 3. These cost estimates include direct labor expended on the tasks, a fatigue allowance for the labor, leave and fringe benefits, and material costs such as the cost of phone calls or postage where quantified. The sources of this information included appropriate work standards and data from management reports, as well as best guesses from functional experts. Additionally, the following grade levels were assumed for the functions represented in the decision tree: post award supply center personnel GS-11/5, supply operations personnel GS-11/5, industrial specialists GS-11/5, contract management assistants GS-5/5. Further details on the cost estimates can be found in Appendix A.
- 6. Branch Probabilities. The weighted branch probabilities for the decision tree are also shown in Table 3. As with the subtask cost estimates, the decision tree branch probabilities were obtained from work standards, management reports and best estimates. These weighted probabilities actually represent the frequency which a specified task is performed. Therefore, values greater than one may occur. We will still refer to these values as probabilities, however. Further details can be found in Appendix A.
- 7. Direct Cost Findings. Using the hierarchical approach to describe the functions performed by DLA as a result of late delivery, the average cost per incident of late delivery was computed to be \$11.06 or 0.21 percent of average replenishment contract costs (see Table 3). Much of the data used to compute this value was based on estimates, so the actual cost is difficult to identify accurately. The average cost is sensitive to several of the input data elements, but not so sensitive to be significant when compared to the indirect costs. The direct cost is small primarily because DLA does relatively little to correct the situation. That effort which is expended in resolving late deliveries is used primarily on contracts which have been delinquent for quite some time (over ninety days).
- C. Examples of Usage of Results. This section explains two possible methods for applying the costs of late delivery developed in this study.
- 1. <u>Bid Evaluation</u>. The costs of late delivery can be applied to the bid evaluation process. The daily lateness costs can be used to provide a premium to contractors demonstrating a better than average delivery history, while assessing a penalty to contractors performing worse than the average. The average delivery history represents the typical cost and provides a reference point against which actual performance can be

DIRECT COST SPREADSHEET

Table 3

		26	300
			7808
OVER 90 DAYS 0.230	60-27 BATT 0.110	1-29 DATS	30
		0. 0.440 220 440	70
F-36 REPORT 1.000	F-38 REPORT 1.000 FTATUS 0.090 8/0 NGT 0.050	FTATUS 0.020 8/0 MCT 0.010 F-36 REPORT 1.000 FTATUS 0.040 8/0 MCT 0.025	
		0.027 0.010 0.010	7808
0.5762	.5762 -5772	0.5762 0.5772	EFFORT
PROZESING	PROCESSING	PROCESSING	200
1.000		1.1. 888	780
	0.0000	e. 9000	EFFORT
ORTAIN F-38 DET ACTION MAIL F-38 REV REPLY ORTAIN FILE EDON FILE ABOL BATA MAKK LSTING PREP NOD STS INPUT	OSTAIN F-34 NAT LETION NAIL F-34 NAIL F-36 NAI	ORIALE F-38 DET ACTION HALL F-38 REV REPLY HACK LETING PREP HOD PREP HOD	
3.000 3.000 3.000 3.000 3.000 3.000 3.000	2.000 2.000 2.000 2.000	1.000 1.000 1.000 1.000	1
0.0077 0.0027 0.0027 0.0062 0.0062 0.0287 0.0287 0.0370 0.0477	9.8017 9.8027 9.0062 9.0062 9.0011 9.0675	0.0017 0.0027 0.0062 0.0011	27762
82.500	\$2.500 \$6.620	\$2.500 \$2.500	- Increase
90.033 90.113 90.113 90.113 90.114 90.176 90.276 90.276 90.420 90.420	90,000 90,910 90,917 90,036 90,036 90,040 90,040 90,040 90,043	90.047 90.047 90.006 90.016 90.016 90.016 90.040 90.040 90.040	- CARA C.
90,000 90,000 90,000 90,000 90,000 90,000 90,000 90,000 90,000 90,000	85.800 85.800 85.800 85.800 85.800 85.800 85.800 85.800	90.022 90.000 90.000 90.000 90.000 90.000 90.000 90.000 90.000	
z.			

PROCEST 0.011 0.230 | 90 1 N.Y BY MESP 1.000 RECONCILIATI 1.000 8 2 2 300 0.864 | < 12 BAYS 0.000 0.0000 8.110 | CM 0.024 PROS > 12 BAYS .. 1.500 18 YESTEL PEXTOCOL TERMINATE STANDS DELLAY BOT ונישו זמישו 300 1.000 0.1600 1.000 0.0000 0.750 1.500 0.1825 1.000 2.000 0.0307 0.286 0.5455 0.046 1.0738 0.010 2.5000 PROB EFFORT \$123 18 ASSIST 0.500 M BE SPOND ADOL . 18FO RECY BOST DO 375-2 THE DELLY NESS DELAY HODE 1.000 0.1172 1.000 0.1710 1.000 0.2609 1.000 0.1888 0.126 0.345 0.080 0.4485 0.253 0.4362 PROB EFFORT 0.5761 1.0484 AGEL 1870 1.000 9.1779 DE SPOND ISON ADEL 300 1.000 0.2609 1.000 0.1172 PROB EFFORT | MATERIAL | LABOR COST 80.00 80.75 \$0.240 80.020 10.820 30.020 \$123.000 82.18 22.1% 27-78 82.928 83.53 ••••• 82.007 80.549 20.000 20.373 80.24 80.449 80.0KZ 8 **90.050** 80.249 \$0.005 \$0.017 80.112 50.GL MI DOST 35.000 30,000 80,600 20.000 30.000 000,00 80,000 80. TA 80,000 90.000 30,900 20.021 30.000 80.000 80.000 \$0.000 80.000 90.000 30.800 311.054 \$123,000 ******* 815.377 24.362 STATOL

Table 3 (Continued)

measured. For example, suppose contractor A has a performance record of 95 percent on-time deliveries, contractor B has a performance record of 69 percent on-time deliveries and contractor C has a performance record of 50 percent on-time deliveries. Furthermore, suppose that contractor A's late deliveries are on the average 15 days late, contractor B's are 50 days late and contractor C's are 40 days late. The FSC for which they are bidding has a daily lateness safety level cost ratio of 0.12 percent. The premiums/penalties assessed in this bid evaluation would be calculated as follows:

To compute the expected costs due to late delivery use the formula

The expected cost of lateness for any purchase (using the average DGSC values) would then be

AVERAGE:
$$0.31 * (0.21 + 49 * 0.12) = 1.89 *$$

And the corresponding expected costs for each of the three contractor's in this example and their differences from the average are computed as

A:
$$0.05 * (0.21 + 15 * 0.12) = 0.10 - 1.89 = 1.79 % premium$$

B:
$$0.31 * (0.21 + 50 * 0.12) = 1.93 - 1.89 = 0.04 * penalty$$

C:
$$0.50 * (0.21 + 40 * 0.12) = 2.51 - 1.89 = 0.62 % penalty$$

Therefore, contractor A's bid would be accepted over contractor C's bid if it is up to 2.41 percent greater, since the overall expected costs to DLA (on the basis of past delivery performance) would be less. The application of this approach requires having valid historical data on contractor performance which accurately identifies the delinquency as either contractor or government caused. Lack of an adequate contractor performance history database could lead to erroneous assignment of evaluation factors.

2. Liquidated Damages. An alternative method to applying the late delivery costs incurred by DLA is in the assessment of liquidated damages. This approach would entail obtaining damages from the contractor based on the cost to DLA of the late delivery. As an example, assume that a contractor delivers late on a particular contract by 75 days. Furthermore, assume that the FSC for the item has a daily lateness cost percentage of 0.12 percent and the direct cost of lateness is 0.21 percent. The cost of the late delivery can be computed as follows:

Therefore, if the contract had a total value of \$5000, the lateness cost would be computed

COST: (0.21 percent + 75 days * 0.12 %/day) * \$5000 = \$461

The liquidated damages could be assessed as \$461, or 9.21 percent of the contract cost.

IV. CONCLUSIONS

A. <u>Cost of Late Delivery</u>. A typical late delivery to the Defense General Supply Center leads to roughly \$314 in indirect costs and \$11 in direct costs. These costs represent about six percent of the contract cost. The indirect costs vary considerably by item (from zero to fifty percent of the contract value for items with many buys), and are significant in those cases where a late delivery leads to a substantial change in the safety level which is maintained for the item. The direct costs are relatively insignificant because little effort is expended to correct late deliveries. There is little to deter a vendor from delivering past the contracted delivery date. (The standard thirty day grace period may even encourage late deliveries.)

B. <u>Use of Late Delivery Cost</u>

- 1. Application in Bid Evaluation Process. It is viable to use contractor performance history in evaluating bids, provided that an adequate performance history is available. One approach to apply contractor performance to the evaluation of bids has been demonstrated in this report; others are available as well. A significant limitation of this approach is the requirement for an accurate contractor performance history database. The present database is of questionable validity and could lead to the unjustified awarding of premiums or penalties.
- 2. Assessment of Liquidated Damages. Another way which the late delivery cost estimates developed in this analysis could be applied is in the assessment of liquidated damages in the event of late vendor delivery. Both the indirect and direct cost could be recovered as damages. This approach would avoid the potential problem of having inadequate contractor performance history data. The actual performance on any given contract would be used to compute the damages rather than the anticipated performance. Consistent collection of significant damages might provide a real incentive for contractors to meet the contract delivery date.
- V. <u>RECOMMENDATIONS</u>. We recommend that the cost of late delivery developed in this study be utilized in a test application at DGSC using one or both of the approaches described above. This test would determine if the costs of late delivery could be used effectively in the contracting and production management areas to reduce costs incurred by DLA as a result of poor contractor performance. If successful, similar factors should be developed for the other hardware centers for their use.

APPENDIX A

BACKGROUND INFORMATION FOR THE DIRECT COST DECISION TREE

APPENDIX A - DIRECT COST DECISION TREE DATA BACKGROUND

1. DSC ADMINISTERED -

Weighted Probability = 0.770

Source: DGSC-PRN IOM dated 24 Jun 87, SUBJECT: Response to Data

Request Dated 28 Apr 87

1.1. 1-29 DAYS -

Weighted Probability = 0.440

Source: DGSC-PRN IOM dated 24 Jun 87, SUBJECT: Response to Data

Request Dated 28 Apr 87

1.1.1. STATUS -

Weighted Probability = 0.020

Source: Estimate

Effort = 0.5762

Source: DIMES Standard 1510

Material Cost = \$ 2.50

Source: Estimate

1.1.2. BACKORDER MANAGEMENT -

Weighted Probability = 0.010

Source: Estimate

Effort = 0.5722

Source: DIMES Standard 2102

1.2. 30-59 DAYS -

Weighted Probability = 0.220

Source: DGSC-PRN IOM dated 24 Jun 87, SUBJECT: Response to Data

Request Dated 28 Apr 87

1.2.1. F-38 REPORT -

Weighted Probability = 1.000

Source: Estimate

1.2:1.1. GENERATION -

Weighted Probability = 1.000

Source: Estimate from conversation with DGSC-PRN

Material Cost = \$ 0.02 Source: Estimate

1.2.1.2. PROCESSING -

Weighted Probability = 1.000 Source: Estimate

1.2.1.2.1. OBTAIN F-38 -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0017

Source: DIMES Standard 1550

1.2.1.2.2. DETERMINE ACTION -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0029

Source: DIMES Standard 1550

1.2.1.2.3. MAIL F-38 -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0062

Source: DIMES Standard 1550

Material Cost = \$ 0.24 Source: Estimate

1.2.1.2.4. REVIEW REPLY -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0062

Source: DIMES Standard 1550

1.2.1.2.5. MARK LISTING -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0011

Source: DIMES Standard 1550

1.2.1.2.6. PREPARE MODIFICATION -

Weighted Probability = 0.153 Source: DIMES Standard 1550

Effort = 0.0670

Source: DIMES Standard 1550

1.2.1.2.7. SYSTEM INPUT -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0675

Source: DIMES Standard 1550

1.2.2. STATUS -

Weighted Probability = 0.040

Source: Estimate

Effort = 0.5762

Source: DIMES Standard 1510

Material Cost = \$2.50 Source: Estimate

1.2.3. BACKORDER MANAGEMENT -

Weighted Probability = 0.025

Source: Estimate

Effort = 0.5722

Source: DIMES Standard 2102

1.3. 60-89 DAYS -

Weighted Probability = 0.110

Source: DGSC-PRN IOM dated 24 Jun 87, SUBJECT: Response to Data

Request Dated 28 Apr 87

1.3.1. F-38 REPORT -

Weighted Probability = 1.000

Source: Estimate

1.3.1.1. GENERATION -

Weighted Probability = 2.000

Source: Estimate from conversation with DGSC-PRN

Material Cost = \$0.02

Source: Estimate

1.3.1.2. PROCESSING -

Weighted Probability = 2.000

Source: Estimate

1.3.1.2.1. OBTAIN F-38 -

Weighted Probability = 2.000

Source: DIMES Standard 1550

Effort = 0.0017

Source: DIMES Standard 1550

1.3.1.2.2. DETERMINE ACTION -

Weighted Probability = 2.000

Source: DIMES Standard 1550

Effort = 0.0029

Source: DIMES Standard 1550

1.3.1.2.3. MAIL F-38 -

Weighted Probability = 2.000

Source: DIMES Standard 1550

Effort = 0.0062

Source: DIMES Standard 1550

Material Cost - \$ 0.24

Source: Estimate

1.3.1.2.4. REVIEW REPLY -

Weighted Probability = 2.000

Source: DIMES Standard 1550

Effort = 0.0062

Source: DIMES Standard 1550

1.3.1.2.5. MARK LISTING -

Weighted Probability = 2.000 Source: DIMES Standard 1550

Effort = 0.0011

Source: DIMES Standard 1550

1.3.1.2.6. PREPARE MODIFICATION -

Weighted Probability = 0.306 Source: DIMES Standard 1550

Effort = 0.0670

Source: DIMES Standard 1550

1.3.1.2.7. SYSTEM INPUT -

Weighted Probability = 2.000 Source: DIMES Standard 1550

Effort = 0.0675

Source: DIMES Standard 1550

1.3.2. STATUS -

Weighted Probability = 0.090

Source: Estimate

Effort = 0.5762

Source: DIMES Standard 1510

Material Cost = \$ 2.50 Source: Estimate

1.3.3. BACKORDER MANAGEMENT -

Weighted Probability = 0.050

Source: Estimate

Effort = 0.5722

Source: DIMES Standard 2102

1.4. OVER 90 DAYS -

Weighted Probability = 0.230

Source: DGSC-PRN IOM dated 24 Jun 87, SUBJECT: Response to Data

Request Dated 28 Apr 87

1.4.1. F-38 REPORT -

Weighted Probability = 1.000 Source: Estimate

1.4.1.1. GENERATION -

Weighted Probability = 3.000

Source: Estimate from conversation with DGSC-PRN

Material Cost = \$ 0.02 Source: Estimate

1.4.1.2. PROCESSING -

Weighted Probability = 3.000 Source: Estimate

1.4.1.2.1. OBTAIN F-38 -

Weighted Probability = 3.000 Source: DIMES Standard 1550

Effort = 0.0017

Source: DIMES Standard 1550

1.4.1.2.2. DETERMINE ACTION -

Weighted Probability = 3.000 Source: DIMES Standard 1550

Effort = 0.0029

Source: DIMES Standard 1550

1.4.1.2.3. MAIL F-38 -

Weighted Probability = 3.000 Source: DIMES Standard 1550

Effort = 0.0062

Source: DIMES Standard 1550

Material Cost = \$ 0.24 Source: Estimate

1.4.1.2.4. REVIEW REPLY -

Weighted Probability = 3.000 Source: DIMES Standard 1550 Effort = 0.0062

Source: DIMES Standard 1550

1.4.1.2.5. OBTAIN CONTRACT FILE -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0287

Source: DIMES Standard 1550

1.4.1.2.6. EXAMINE CONTRACT FILE -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0290

Source: DIMES Standard 1550

1.4.1.2.7. OBTAIN ADDITIONAL DATA -

Weighted Probability = 1.000 Source: DIMES Standard 1550

Effort = 0.0355

Source: DIMES Standard 1550

Material Cost = \$ 2.50 Source: Estimate

1.4.1.2.8. MARK LISTING -

Weighted Probability = 3.000 Source: DIMES Standard 1550

Effort = 0.0011

Source: DIMES Standard 1550

1.4.1.2.9. PREPARE MODIFICATION -

Weighted Probability = 0.459 Source: DIMES Standard 1550

Effort = 0.0670

Source: DIMES Standard 1550

1.4.1.2.10. SYSTEM INPUT -

Weighted Probability = 3.000 Source: DIMES Standard 1550 Effort = 0.0675

Source: DIMES Standard 1550

1.4.2. STATUS -

Weighted Probability = 0.120

Source: Estimate

Effort = 0.5762

Source: DIMES Standard 1510

Material Cost = \$2.50

Source: Estimate

1.4.3. BACKORDER MANAGEMENT -

Weighted Probability = 0.100

Source: Estimate

Effort = 0.5722

Source: DIMES Standard 2102

2. DCAS ADMINISTERED -

Weighted Probability = 0.230

Source: DGSC-PRN IOM dated 24 Jun 87, SUBJECT: Response to Data

Request Dated 28 Apr 87

2.1. SURVEILLANCE CATEGORY 1 -

Weighted Probability = 0.026

Source: Estimate developed from DLA-AP Phonecon

2.1.1. TERMINATE -

Weighted Probability = 0.010

Source: Estimate

Effort = 2.5000

Source: Estimate

2.1.2. EXPEDITE -

Weighted Probability = 0.046

Source: DIMES Standard 2222

Effort = 1.0738

Source: DIMES Standard 2222

2.1.3. UPDATE SURVEILLANCE PLAN -

Weighted Probability = 0.288 Source: DIMES Standard 2222

Effort = 0.5666

Source: DIMES Standard 2222

2.1.4. DELAY REPORT

Weighted Probability = 1.000 Source: Estimate

2.1.4.1. DD 375-2 -

Weighted Probability = 0.253 Source: DIMES Standard 2222

Effort = 0.4862

Source: DIMES Standard 2222

Material Cost = \$ 0.02 Source: Estimate

2.1.4.2. DD 375 -

Weighted Probability = 0.345 Source: DIMES Standard 2222

Effort = 1.0484

Source: DIMES Standard 2222

Material Cost = \$ 0.02 Source: Estimate

2.1.4.3. MESSAGE DELAY -

Weighted Probability = 0.126 Source: DIMES Standard 2222

Effort = 0.5761

Source: DIMES Standard 2222

Material Cost = \$ 0.02 Source: Estimate

2.1.4.4. LETTER DELAY -

Weighted Probability = 0.080 Source: DIMES Standard 2222

Effort = 0.4485

Source: DIMES Standard 2222

Material Cost = \$ 0.24 Source: Estimate

2.1.5. FILE WORKFOLDER

Weighted Probability = 2.000

Source: Estimate developed from DIMES Standard 2222

Effort = 0.0307

Source: DIMES Standard 2222

2.2. SURVEILLANCE CATEGORY 2 -

Weighted Probability = 0.110

Source: Estimate developed from DLA-AP Phonecon

2.2.1. CONTRACT MANAGEMENT ASSISTANT -

Weighted Probability = 1.500

Source: Estimate developed from conversation with DLA-AP

Effort = 0.1244

Source: DIMES Standard 2232

2.2.2. INDUSTRIAL SPECIALIST ASSIST -

Weighted Probability = 0.750

Source: Phonecon with DCASMA-Baltimore (Norfolk Office)

2.2.2.1. RECEIVE REQUEST -

Weighted Probability = 1.000

Source: Estimate

Effort = 0.1172

Source: DIMES Standard 2222

2.2.2.2. OBTAIN ADDITIONAL INFORMATION -

Weighted Probability = 1.000

Source: Estimate

Effort = 0.1710

Source: DIMES Standard 2222

Material Cost = \$0.25

Source: Estimate

2.2.2.3. RESPOND TO CMA -

Weighted Probability = 1.000

Source: Estimate

Effort = 0.2609

Source: DIMES Standard 2222

2.3. SURVEILLANCE CATEGORY 3 -

Weighted Probability = 0.864

Source: Estimate developed from DLA-AP Phonecon

2.3.1. LESS THAN 12 DAYS -

Weighted Probability = 0.000

Source:

2.3.2. GREATER THAN OR EQUAL TO 12 DAYS -

Weighted Probability = 1.500

Source: Estimate developed from conversations with DLA-AP

2.3.2.1. CONTRACT MANAGEMENT ASSISTANT -

Weighted Probability = 1.000

Source: Estimate developed from conversation with DLA-AP

Effort = 0.1244

Source: DIMES Standard 2232

2.3.2.2. INDUSTRIAL SPECIALIST ASSIST -

Weighted Probability = 0.500

Source: Phonecon with DCASMA-Baltimore (Norfolk Office)

2.3.2.2.1. RECEIVE REQUEST -

Weighted Probability = 1.000

Source: Estimate

Effort = 0.1172

Source: DIMES Standard 2222

2.3.2.2. OBTAIN ADDITIONAL INFORMATION -

Weighted Probability = 1.000

Source: Estimate

Effort = 0.1710

Source: DIMES Standard 2222

Material Cost = \$0.25

Source: Estimate

2.3.2.2.3. RESPOND TO CMA -

Weighted Probability = 1.000

Source: Estimate

Effort = 0.2609

Source: DIMES Standard 2222

2.4. DELINQUENT CONTRACT RECONCILIATION -

Weighted Probability = 1.000

Source: Estimate

Effort = 0.0800

Source: Estimate

2.5. DELAY REPORT RESPONSE (DSC) -

Weighted Probability = 1.000

Source: Estimate

Effort = 0.1600

Source: Estimate

3. REPROCURE

Weighted Probability = 0.011

Source: Estimate developed from conversation with DGSC-PRN

Cost: \$123

Source: SAMMS implied order cost, DLA-DORO IOM, dated 3 Jul 86,

SUBJECT: Economic Order Quantity (EOQ) Cost to Order, G608

